PROPERTY PLANNING COMMON ELEMENTS

COMPONENTS OF MASTER PLANS

HABITATS AND THEIR MANAGEMENT

Lake Aeration

Description

Winterkill is a term used to describe the loss of fish over the winter due to lack of oxygen in a waterbody (lake or impoundment). Submerged vegetation and algae create oxygen through photosynthesis. During the winter, oxygen production often is reduced because ice and snow on the lake limit the amount of sunlight reaching vegetation. In small, shallow lakes, the available oxygen can quickly be used up by live plants, fish, and by bacteria that feed on dead and decaying vegetation. When the oxygen level declines, less tolerant fish species and fish in poor condition overall can begin to suffocate.

Some species of fish are more vulnerable to winterkill than others. Trout require the most oxygen and start to stress at oxygen levels below 5 parts per million (ppm). Bluegill and largemouth bass also are moderately sensitive to lowered oxygen levels. Walleye, yellow perch, northern pike, carp, and crappie species have intermediate tolerances down to about 2 ppm, while bullheads and fathead minnows are the most tolerant of low oxygen. Winterkills seldom result in the death of all fish in a lake. Lakes with regular winterkill events usually are dominated by less desirable game fish such as bullhead species.

Winterkill is a natural process and not all results are detrimental. In lakes that support game fish, the fish population can rebound quite dramatically in years following winterkill. While some lakes have aeration systems installed to reduce the possibility of winterkill, others are managed as "boom or bust" fisheries. Aeration can greatly reduce or eliminate winterkill and thus improve sport fishing opportunities.

The installation and maintenance of lake aeration units should include the following:

- Compliance with all water permit requirements.
- Dissolved oxygen level sampling conducted on aeration sites throughout winter months.
- Compliance with state safeguard statues regarding aeration sites through maintenance of the required safety fence and safety signs that are put in place each winter during aeration system operation.
- Annual inspections of compressed, aspirating, and solar aeration motors, lines, and electrical equipment.
- Maintenance of properly functioning aeration systems through replacement of vanes, lines, floats, fencing, rope, repair of aeration sheds, etc.

Considerations

- Historic frequency of winterkill
- External nutrient loading
- Lake morphometry

- Presence of black bullhead and common carp
- Siting and sizing